

I can develop and apply the formula for midpoint.

I can use the Distance Formula and the Pythagorean Theorem to find the distance between two points.

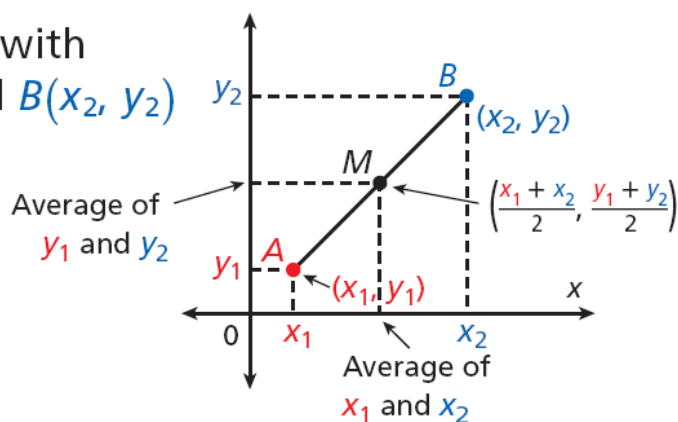
**Common Core: CC.9-12.G.GPE.7** Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.

You can find the midpoint of a segment by using the coordinates of its endpoints. Calculate the average of the x-coordinates and the average of the y-coordinates of the endpoints.

### Midpoint Formula

The midpoint  $M$  of  $\overline{AB}$  with endpoints  $A(x_1, y_1)$  and  $B(x_2, y_2)$  is found by

$$M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right).$$



### Helpful Hint

To make it easier to picture the problem, plot the segment's endpoints on a coordinate plane.

Refer to example 1 on page 43.

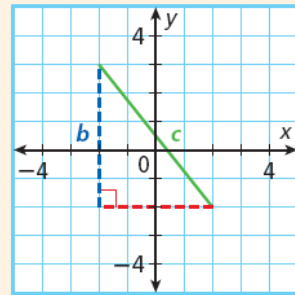
Refer to example 2 on page 44.

You can use the Pythagorean Theorem to find the distance between two points in a coordinate plane. You will learn more about the Pythagorean Theorem in Chapter 5.

### **Theorem 1-6-1** Pythagorean Theorem

In a right triangle, the sum of the squares of the lengths of the *legs* is equal to the square of the length of the *hypotenuse*.

$$a^2 + b^2 = c^2$$



Refer to example 4 on page 45.

### **Distance Formula**

In a coordinate plane, the distance  $d$  between two points  $(x_1, y_1)$  and  $(x_2, y_2)$  is

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}.$$

Refer to example 3 on page 44.

1.6 Assignment: (pp 47-48) 12-18 even, 21, 26, 30.